

**EXHIBIT A**

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicants: Steven Say-kyoun Ow and Tae Jin Eom

Serial No. 09/121,152

Art Unit: 1731

Filed: May 6, 1994

Examiner: Steve Alvo

For: Biological De-Inking Method

**DECLARATION UNDER 37 C.F.R. 1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Howard Kaplan, hereby declare that:

1. I am employed at Enzymatic Deinking Technologies, Norcross, GA, as its chief operating officer. Enzymatic Deinking Technologies is the licensee of the above-identified patent application.
2. I instructed my laboratory manager, Jian Hua Ma, to conduct experiments to compare the deinking of recycled paper using the conditions described in example 2 of Japanese patent application No. 59-9299 ("the JPA") and the above-identified patent application.
3. I reviewed JPA to determine the conditions and materials described therein for the enzyme enhanced deinking of recycled paper. The only conditions were described in the examples. Example 1 added a number of materials other than an enzyme and NaOH. Example 2 examined the effect of adding 1% by weight NaOH and an alkaline cellulase. It was my understanding that the examiner preferred we use the conditions of Example 2 so that there would be fewer variables. We therefore conducted a comparison of the deinking of recycled

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paper as described in example 2, with the claimed method which requires a pH of less than 8, differing in the pH of the reaction mixtures and the cellulases which were added.

4. Example 2 does not provide a pH of the reaction mixture but instead refers to adding 1% (relative to the old newspaper) NaOH. This creates a pH of 10.6. For purposes of comparison, NaOH was not added to the reaction mixture of the claimed method. The pH of the reaction mixture was 7.2.

5. It was not possible to obtain any of the enzymes described at page 3 of the JPA. We contacted Amano Pharmaceutical Co. and tried to locate Ueda Kagaku, who are listed as the manufacturers. We also searched a number of catalogs and on the internet. Amano did not sell the named enzyme and Ueda appears to be out of business. We then obtained an equivalent alkaline cellulase from Meiji Seika, HEP-100, an alkaline cellulase which is active over a range of at least 4.0 to 10.0, with a pH optimum of 8.0. For purposes of comparison, a neutral cellulase was obtained from Novozymes, Novozym 342 produced by the fungus *Humicola insolens*, which has an optimum pH of between 6.5 and 7.5.

6. As described in Example 2 of the JPA, each reaction mixture contained old newspapers, cut in 2 x 5 cm pieces, fed into a laboratory disintegrator, water and, for the JPA study, 1.0% NaOH, relative to raw material old paper, and disintegration done at pulp concentration 5%, 40°C for 20 minutes. After disintegration, 0.2% enzyme relative to raw material old paper as described in example 2 was added to the mixture containing the 1% NaOH and an equivalent amount of enzyme added to the other reaction mixture, and stirring was done at 45°C for one hour. The pulped material was then concentrated to 15% pulp concentration, diluted to 1% by

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added water, and filtered through a Buchner funnel. The paper in the funnel and the filtrate were then analyzed.

7. The whiteness of the treated pulp (L-value) and the whiteness of the removed liquid (L-value) were determined for paper and filtrates from both samples.

The results showed that the treatment at the lower pH was more effective than the treatment at the higher pH, despite the use of the 1% NaOH to swell the cellulose fibers and release the ink in the paper as well as the use of a cellulase.

	<u>Paper L-value</u>	<u>Filtrate L-value</u>
JPA sample with 1% NaOH	65.9%	60.6%
Ow sample at pH 7.2	66.6%	56.8%

8. Not only were the results superior without NaOH treatment, but the cost of the treatment in the absence of the NaOH is reduced since NaOH costs about \$300/ton on a 50% basis.

9. The undersigned declares that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements are made with the knowledge that willful false statements are punishable by fine or imprisonment or both under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the above-identified patent application or any patent issuing thereon.

Date:



Howard Kaplan

**EXHIBIT B**

(Translation)

**CERTIFICATE OF GRANT OF PATENT**

Patent Number 1,889,973

JP-Appln.No. Heisei-1-258,623  
JP-B-Heisei 4-009231

Title of Invention : Biological Deinking Method

Patentee : Korea Research Institute of Chemical Technology

Address : #100 Jang-dong Usung-ku, Daejeonjikhul-shi, Republic of Korea

Nationality : Republic of Korea

Inventor : Tae Jin Eom

Steven Say-Kyoun Om

We prove that this Invention is concluded to be patented, and is verified as the one registered in Original Register of patent.

Dec. 7, Heisei 6(1994)

Director-General of the Patent Office

**Dakasima Show**

特 許 証

特 許 第 1 8 8 9 9 7 3 号

平成01年 特 許 願 第 2 5 8 6 2 3 号

平成04年特許出願公告第009231号

発 明 の 名 称

古紙の生化学的脱墨に依る再生方法

特 許 権 者

大韓民国大田直轄市儒城区長洞100  
国 籍    韓 国

財団法人韓国化学研究所

発 明 者

嚴 泰 振

吳 世 均

この発明は、特許するものと確定し、特許原簿に登録されたことを証する。

平成 6 年 1 2 月 7 日

特 許 庁 長 官

高 島

章

(TRANSLATION)

**Registered Copy Of Decision Of Opposition To Patent**

Patent Appln. No. Heisei-1-258,623

Examiner : Ohno

Title of invention : Biological Deinking Method

Applicant : Korea Research institute of chemical Technology

Patent Attorney : Hisao Okuyama et al.

Opponent : Honshu Paper Manufacturing Co., Ltd.

**CONCLUSION**

The application for opposition is decided to be unreasonable.

**REASON**

The subject matter of the invention is considered in the followings as described in the claims of the specifications:



What we claimed is:

1. A biological deinking method comprising the steps of pulping waste printed paper with an enzyme by controlling the pH to a range of 3 to 8; and removing ink particles from fibers of the waste printed paper by a flotation and/or washing method.
  2. The method as claimed in claim 1, wherein cellulose and/or pectinase is used as the enzyme.
  3. The method as claimed in claim 1 or 2, wherein the added amount of the enzyme is in a range of 0.005% to 5% on the basis of a dry weight of the waste paper.
  4. The method as claimed in claim 1, wherein a temperature of said steps is controlled in a range of room temperature to 60°C.
- JP-A-Heisei 2-80583, a publication submitted by the demurrant as an evidence against the present application, describes "A process for de-inking waste paper comprising enzyme treatment by add

-ing an enzyme containing at least one cellulase to waste paper slurry having 3~10% of pulp concentration, followed by de-inking treatment". Thus, as comparing the present invention with the invention described in the specification of JP-A-Heisei 2-80683, they are quite different from each other in that the former comprises "controlling the pH of waste printed paper in a range of pH 3 to 8 and then pulping by the use of enzyme", while the latter comprises "enzyme treatment by adding an enzyme containing at least one cellulase to a waste paper slurry having 3~10% of pulp concentration", i.e. "the waste paper slurry (pulp) is treated by enzyme after the waste printed paper was pulped(maceration)". Further, there is no description about "the pulping(maceration) of waste printed paper by enzyme", i.e. "adding an enzyme to the waste printed paper, and then pulping". Thus, the present invention cannot be construed to be identical to the invention described in the specification of JP-A-Heisei 2-80683.

In the publication of JP-A-59-9299, there is no description or



suggestion of "pulp~~ing~~ after controlling the pH in the range of 3 to 8", a part of the construction of the present invention, though there described "de-inking agent for recycling waste paper, containing cellulase" and "adding the de-inking agent for recycling waste paper together with alkali to waste paper to carry out maceration".

On the other hand, it is apparent from the specification of the present invention that the above mentioned constructional requirement renders a curtailment of the cost of de-inking chemicals and enhancement of the physical properties of the produced pulp fiber. Thus, the present invention cannot be construed to be easily inventable by a person having ordinary skill in the art from the description of JP-A-59-9299. Therefore, the insistences of the demurrant that the present invention is identical to the invention described in JP-A-Heisei-80683 and that the present invention can be easily invented by a person having ordinary skill in the art from the description of JP-A-59-9299 cannot be accepted.

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## 特許異議の決定謄本

特許出願の番号

平 特願昭 01-258623 1

平成 06 年 03 月 23 日

特許庁審査官

小野 寺 務

④

8,118

3B

発 明 の 名 称 古紙の生化学的脱墨に依る再生方法

特 許 出 願 人 財団法人 韓国化学研究所

代 理 人 奥 山 尚 男 外 2 名

特許異議申立人 本州製紙株式会社

代 理 人 山 本 和 誠

### 結 論

この特許異議の申立は、理由がないものと決定する。

### 理 由

本願発明の要旨は、その明細書の特許請求の範囲に記載された通りの「1枚印刷紙を、pH3〜8の範囲に制御して酵素によりパルプ化し、として浮選及び/または洗浄法により繊維からインク粒子を除去することを特徴とする生物学的脱インク法。――  
2酵素としてセルラーゼ及び/またはペクチナーゼを使用することを特徴とする請求項1記載の生物学的脱インク法。  
3枚印刷紙の乾燥重量を基にして0.005%〜5%の範囲の量の酵素を添加することを特徴とする請求項1または2記載の生物学的脱インク法。

この謄本は原本と相違しないことを認証する。

平成 年 月 日

通商産業事務官

0.8.23

四 官 勉

送 日

6.8.23



4 パルプ化プロセスの温度を室温から60℃までの範囲に制御することを特徴とする請求項1記載の生物学的脱インク法。」にあるものと認められる。

これに対し、特許異議申立人の引用した甲第1号証である、本願の優先権主張日以前に出願され、かつその日以後に出願公開された特願昭63-203827号の特許出願の願書に最初に添付された明細書と同一であると認められる、その公開特許公報(特開平2-80683号公報)には、「パルプ濃度3~10%の古紙スラリーに少なくとも1種類のセルラーゼを含む酵素を添加して酵素処理し、次いで脱墨剤処理することを特徴とする古紙の脱墨処理法。」が記載されている。

そこで、本願発明と甲第1号証に係る明細書に記載された発明とを比較すると、前者においては、「故印刷紙を、pH3~8の範囲に制御して酵素によってパルプ化し」ているのに対し、後者においては、「パルプ濃度3~10%の古紙スラリーに少なくとも1種類のセルラーゼを含む酵素を添加して酵素処理」している点、即ち故印刷紙のパルプ化(離解)の前に酵素を添加した後、パルプ化するが、故印刷紙のパルプ化(離解)の後に古紙スラリー(パルプ)に対して酵素を添加し処理するかという点で、両者は相違している。

さらに、甲第1号証に係る明細書には、「故印刷紙を酵素によってパルプ化」すること、即ち故印刷紙に酵素を添加した後、パルプ化(離解)することに関しては全く記載されていない。

したがって、本願発明は甲第1号証に係る明細書に記載された発明と同一であるとは認められない。

同じく、甲第2号証の刊行物には、「セルラーゼを含む古紙

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発送日	
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再生用脱墨剤」が記載されており、該古紙再生用脱墨剤をアルカリと共に古紙に添加し、溶解することが記載されているが、本願発明の構成の一部である「pH3~8の範囲に制御して」パルプ化する点に關しては、記載されていないばかりか、それを否定する記載もない。

一方、本願発明においては、上記した構成要件を備えることにより、脱インク化学品コストを削減できると共に生成するパルプ繊維の物理的性質が向上することは本願明細書の記載からみて明らかである。

したがって、本願発明は甲第2号証の記載に基いて当業者が容易に発明することができたものであるとは認められない。

よって、本願発明は甲第1号証に係る明細書に記載された発明と同一であり、または甲第2号証の記載から当業者が容易に発明することができたものであるとする特許異議申立人の主張は採用できない。

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6.8.23	

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